

FOOD AND
NUTRITION
TECHNICAL
ASSISTANCE

**Building Household Food
Security Measurement Tools
From the Ground Up**

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Food and Nutrition Technical Assistance Project

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BRIEF SUMMARY

For impact evaluation and planning and targeting decisions, local organizations in developing countries need tools for assessing household food security that go beyond measuring food availability to include access to food and perceptions of food insecurity. This paper explores the potential for developing direct measures of household food security that include such components and that are based on an in-depth understanding of the experience of food insecurity at the household level. This process was used successfully to develop the U.S. Food Security Measure. The U.S. approach and examples of efforts in developing countries are reviewed, along with relevant conceptual and measurement issues. The potential portability and challenges to use of the U.S. approach in developing countries are discussed. The elements needed to apply this approach are outlined, along with operations research needed for developing such experiential-based measures.

INTRODUCTION

Humanitarian relief and development organizations increasingly need to measure household food security to monitor and evaluate the impact of programs and make planning and targeting decisions. Existing measures of regional or even local food availability often are inadequate for project-level decision making, since availability is only one component of household food security. Other components such as access to food and certainty of the food supply are also important. One way to develop direct measures that include these components and can complement existing measures is to base them on an in-depth understanding of the experience of food insecurity at the household level, as was used successfully to develop the U.S. Food Security Measure [1]. Although the U.S. measure itself may not be applicable to many developing countries, the approach may well be.

This paper explores the potential for developing improved measures of the access component of household food security based on an in-depth understanding of food insecurity at the household level. Relevant conceptual and measurement issues are discussed, followed by a review of the U.S. approach and examples of efforts in developing countries. These are then used to evaluate the potential portability and challenges to use of the U.S. approach in developing countries. The elements needed to apply this approach are outlined, along with operations research needed for developing such experiential-based measures.

CONCEPTUAL AND MEASUREMENT ISSUES

How best to measure household food insecurity is the subject of much debate, partly due to the difficulty of defining it [2]. The concept of food insecurity as thought about in the U.S. includes not only the lack of availability, access and utilization or use of food (e.g., food preparation, intra-household food distribution), but also perceptions, e.g., that food is insufficient, inadequate, unacceptable, uncertain, or unsustainable (Figure 1). For example, food insecurity has been defined in the U.S. as “the inability to acquire or consume an adequate quality or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so” [3,4]. Food insecurity as experienced in other locations is likely to be somewhat different, but will include similar components that go beyond availability and access.

As shown in Figure 1, food insecurity affects dietary intake and ultimately nutritional status and physical well-being. While measures of dietary intake of individuals can assess some aspects of food insecurity such as caloric insufficiency and nutrient inadequacy, they do not assess the cognitive and affective components of uncertainty (expressed as anxiety), unacceptability, or unsustainability. For example, current intake may be adequate but food insecurity still experienced due to concern over future intake. Alternatively, intake may be inadequate, but only temporarily to protect supplies and prevent future food insecurity. Growth status is also used as an indicator, but again does not assess most of the components of food insecurity. Furthermore, growth status is an indirect outcome since it also depends on factors such as health and child care, in addition to access. Food insecurity is also related to available economic

and social resources. Precursors such as income or total expenditure are commonly used and are correlated with caloric sufficiency, but only capture this component of food insecurity and are quite indirect [5]. Food-related management or “coping” strategies have also been used to assess food insecurity [6,7]. Management strategies both result from and impact the experience of food insecurity and may be useful as early indications of future food insecurity. The presence or absence of particular management strategies, however, is often not indicative of food security, and measures of management strategies do not directly assess important aspects of the experience of food insecurity.

Keeping in mind that the closer or more direct a measure is to the phenomenon of interest, the better that measure will be, it is important to measure the experience of food insecurity itself, including whatever its key components are in a given location [8]. This experience could be objectively and definitively measured by observing in detail a household over time along with interviewing members of that household in depth [8,9]. Since this is infeasible to do for a large number of households, however, this experience can instead be measured subjectively by assessing not only aspects of the availability, access and utilization of food, but also how a person feels about it (e.g., anxiety, worry) and what a person thinks about it (e.g., perceptions, social acceptability). Because these manifestations are overt, we can tap into these to directly measure the experience of food insecurity in a comprehensive manner.

Establishing validity is fundamental to the development of measures. Validation is the process of determining whether a method is suitable for providing useful analytical measurement for a given purpose and context [8]. This process has previously been described relative to the development of food security measures in the U.S. [8,12]. In-depth understanding of food security is crucial for developing valid measures for two reasons. First, for a measure to be valid requires that its construction is well-grounded in an understanding of the phenomenon. Second, in-depth understanding can be used as the basis for creating a definitive criterion against which a developed measure can be compared [8].

THE U.S. NATIONAL FOOD SECURITY MEASURE

The U.S. National Food Security Measure is an example of the use of in-depth understanding to develop and validate a quantitative measure of food security. The measure was based largely on research that involved qualitative, in-depth interviews with low-income, rural women with and without children who had experienced food insecurity [3,4]. The research concluded that: 1) food insecurity is experienced differently at the household, adult, and child levels, 2) adults buffer the effects of food insecurity on children, 3) food insecurity has four components, two related directly to food (quantity and quality of food), and two psychological and social in nature (certainty, related to worry about food, and acceptability, related to how food is acquired), and 4) hunger is the most extreme consequence of the progression of food insecurity.

Items measuring this understanding of food insecurity were derived from statements that described, in the women’s own words, the experience of food insecurity. Twelve of these items (see Table 1), which captured most of the food insecurity components and showed high reliabilities, were subsequently tested in a general population survey of households with children and the resulting measure was found to be

valid. It correlated significantly with risk factors for hunger and its dietary consequences, such as consumption of fruits and vegetables and the amount of food available in the household, it differentiated the degree of severity of food insecurity at both the group and household levels, and it was highly associated with a definitive measure of household food security [10-12]. The definitive measure was developed using qualitative methods involving expert judgement to integrate extensive information from in-person interviews [12].

This measure, slightly modified, was incorporated along with some other measures into a national measure and used in the 1995 national Current Population Survey (Table 1). Based on detailed analysis and testing of these data, a numerical food security scale and a related categorical food-security-status measure were developed for use in both national and local surveys to describe the food security situation of U.S. households during the preceding 12-month period. Further collection, analysis and testing have established the stability and robustness of the measure across years and across major population subgroups, and its validity has been demonstrated [8,12].

A key strength of the U.S. measure, and a reason for its success, is that it is well-grounded conceptually. It is based on an in-depth understanding of the experience of food insecurity in U.S. households. The U.S. measure recognizes, for example, the conceptual difference and complex relationship between the experience of food insecurity and strategies to manage or cope with that experience. The U.S. measure does not include items on management strategies for two reasons. First, when tested, the set of items on management strategies that was available did not meet the statistical criteria for construction into a scale, suggesting that this set of items was not sufficiently coherent and complete. Second, inclusion of these items would not have altered the estimates of prevalence from the measure [13].

Another important strength is that the measure is quick and simple to administer, generally requiring less than four minutes of survey time. This makes it feasible for standard, consistent use nationally as well as at state and local levels, creating comparable data that can be aggregated. When used on a periodic basis, the measure can provide systematic monitoring of progress in addressing food security needs at each of these levels [2].

Another strength is that because each set of items captures a different degree of severity, the measure captures the full range of severity and distinguishes among its different levels. This feature is critical for accurately gauging prevalence of each level of severity [2].

A weakness of the tool is the focus that was placed on its construction as a unidimensional scale, even though food security is understood to be multidimensional. Construction as a unidimensional scale enabled the use of psychometric theory and models to assess properties of the measure. A model that assumes one dimension, however, is a limited abstraction. Reliance on this model led to creating a four-category indicator of food security, with category labels corresponding to severity. This four-category indicator has been criticized as lacking face validity and being less useful and interpretable than would have been possible. The criticism has primarily focused on the rationale for where the cut-points separating the four categories were placed, and on the appearance that the categories were defined on

the basis of only the severity dimension of food security.

An important consideration for wider use of this approach is that the qualitative research that allowed the measure to be well-grounded in an understanding of the experience of food insecurity was very time-consuming, involving in-depth interviews with a large number of women and extensive analyses of these interviews. Operations research is needed to find ways to streamline the process of obtaining in-depth understanding of the experience of food insecurity. Various methods used to understand food insecurity in developing countries are explored below, some of which might be useful for this process.

METHODS FOR UNDERSTANDING FOOD INSECURITY AND DEVELOPING MEASURES

A number of methods have been used to gain an understanding of food insecurity and to apply this understanding to develop measures.

Ethnography

Ethnography involves in-depth interviewing and participant observation, usually by living in a community for an extended period of time. It can be used to help develop quantitative measures. For example, Chung et al. used ethnography in south-central India to understand local perceptions, early signs, coping strategies, and intra-household decision-making related to food security. From this, unique, locally defined indicators of food insecurity were developed [15]. Ethnography was also used in rural Nepal to help develop culturally appropriate and valid quantitative instruments for assessing and operationalizing household food security and for constructing scales of past food supply, current food stores, and adequacy of future food supply [14]. As described above, in-depth interviews were used to understand U.S. food security and to develop the U.S. measure.

Rapid Rural Appraisal

A number of simple tools and techniques for assessing problems and situations at the community level have been developed as part of Rapid Rural Appraisal (RRA) and the similar but more action-oriented Participatory Rural Appraisal (PRA). These often involve focus groups and in-depth interviews. Information gathered through RRA can be used to understand the food security situation and to help develop quantitative measures. Examples of a few such RRA/PRA techniques follow [15-19].

“Food security ranking” involves asking a diversity of key informants to categorize village households by level of food security in the current year, and in good and bad years. “Village mapping” is similar, but involves asking groups of men and women to draw a map of their neighborhood on the ground, identifying food insecure households and causes of food insecurity. Criteria used for categorizing households, differences between years, and causes given can be useful for understanding food insecurity in that community.

“Food security calendars” are useful for understanding the seasonal dimension of food security. Participants are asked to indicate for each food security group and for both good and bad years the months in which they eat until they are full and the months they suffer from hunger. Then the calendar is “interviewed,” asking about consumption patterns and coping strategies for each group during each period of food security, as well as underlying causes of hunger. “Activity calendars” are similar, and involve asking villagers in different food security categories to distinguish between food-related activities they do in good versus bad years or seasons, including coping and investment strategies, and activities and assets that act as buffers against having to resort to coping.

“Bean ranking” is a pictorial method used for a number of different purposes. It can be used to rank households into food security groups and then “interview” the piles of beans to understand the coping strategies and other characteristics of each group, to develop household “food charts,” and to construct histogram-like seasonal charts for rainfall, harvests of staples, food consumption, illness, etc.

Coping Strategies

Maxwell [6,7] developed a method for assessing household food security indirectly through food-related coping strategies, that is, the actions people take when they do not have enough food or money to buy food. In-depth interviews were used to identify coping strategies, then their relative severity was rated by focus groups. A questionnaire assessing frequency of use of each strategy was developed, from which a food security score is derived by applying severity weightings.

Food Economy Approach

The Food Economy Approach monitors household food security and early warning of food crises by quantifying household access to food in normal years and the effects of external shocks on this [20]. Using in-depth interviews and various RRA techniques, a “baseline picture” describing how different families in a geographic-specific “food economy zone” normally obtain food and non-food income is developed, describing sources and means of food and cash income and sometimes expenditure patterns. Potential changes in agricultural, economic or security conditions that affect families’ access to food are also quantified. A software program called “Risk Map” is then used to calculate the extent to which these changes affect different households’ access to food, both overall and the amount this may be reduced by household coping strategies. Results include an estimate of the shortfall in food income that people are likely to face, the costs of coping in terms of depletion of assets and dislocation of families, and the likely effects of different levels and forms of assistance.

Expert Systems

Phillips and Taylor [21] developed a method for assessing household food security that combines a household questionnaire with a quasi-expert analysis system. In-depth interviews were used to develop a conceptual model, then using a modified Delphi technique, local and national experts identified indicators which were used to help develop the questionnaire. The questionnaire includes both open- and closed-ended questions with locally-appropriate responses identified by focus groups. Data analysis uses a complex set of database programs that emulate an expert system, asking questions of the data

until it determines the current level of food security of a given household, the amount of food security “risks” it faces, and the degree of food security “insurance” it has.

Livelihood Security

Based on the assumption that indicators derived from indigenous livelihood systems and methods of prediction and response can outperform conventional famine early warning systems, Davies developed an approach to food security monitoring [22]. Field agents live in or near the communities they monitor for a year, and use in-depth interviews, RRA techniques, and more conventional surveys such as market surveys to understand the local livelihood systems and develop indicators for tracking livelihood vulnerability. These indicators are monitored annually, and used to predict needs and develop appropriate interventions.

Analysis of Examples

All of these examples contributed to a better understanding of the food security situation in their respective locations, but none focused on understanding or developing measures based on the experience of food insecurity itself as in the US approach. The in-depth interviews used in several of the examples, especially combined with RRA techniques, probably provided the information for such an understanding, but the authors focused elsewhere. Chung focused on management strategies to develop targeting indicators. Maxwell obtained detailed understanding of coping strategies. The food economy model focused on economic resources and production. Davies focused on livelihood strategies to develop indicators of future risk.

Thus, although in-depth interviewing of individuals who have experienced food insecurity is needed in addition to focus groups or other RRA methods, obtaining such understanding appears feasible based on these examples. To improve this understanding and help to validate the information collected, methods can be “triangulated” by using different tools with the same groups, and by using different socioeconomic, gender and other groups to capture intra-village heterogeneity in experience and perceptions.

CHALLENGES IN DEVELOPING AND USING EXPERIENTIAL-BASED MEASURES

Processes for Collecting In-Depth Information and Developing Measures

As discussed in the previous section, one challenge to the use of the U.S. approach in developing countries is how to collect in-depth information and use the resulting understanding to create valid measures of food security in a simple and feasible way. Combining some in-depth interviewing with quicker RRA methods might help, although RRA exercises can be time-consuming for local people.

One potential process for obtaining understanding and developing measures has been suggested [17]. First, in-depth interviews and focus groups are used to identify locally-defined food secure and insecure

households and understand food-related activities and other issues such as management strategies in good and bad years. This information is then used by project staff and villagers to identify indicators for monitoring the general food security situation and for showing when food security is worsening in different households. From these, specific indicators that can measure the impact of project activities on food security are selected. This process appears well-conceptualized and has been well-received in the field. Field testing has been limited, however, and has not been fully carried out due to local staff being over-committed with other duties and a lack of perceived importance of the process by project management (J. Aune, personal communication).

Davies [22] also presents a methodology for such a process, and notes that, although feasibility remains an issue, high-quality information about access to food can be reasonably and cost-effectively collected by well-trained local field researchers tapping indigenous sources of information. Maxwell's approach [6,7] of combining interviews, focus groups, and questionnaires is relatively quick and low-cost, taking only a couple of days to use local knowledge to adjust apparently universal categories to be location-specific (D. Maxwell, personal communication). Finally, the rapid method for analysis of largely open-ended interviews developed by Phillips and Taylor might be a model for speeding up analysis.

These examples suggest that simple and feasible data collection and analysis are possible. Further field testing and evaluation of potentially useful processes is needed so that a practical process for wide-spread use can be developed.

Ensuring Validity of Measures

A good measure needs to be relevant, credible, low-cost, time sensitive, and appropriate for the decisions that need to be made [23]. It also usually needs to be comparable across locations. Although some aspects of the experience of food insecurity are probably reasonably universal across locations and cultures, the experience is likely to be locally specific in many aspects. It is not known whether assessment tools that are experiential-based will need to be so location-specific that comparability (and aggregation) will be limited. The U.S. Food Security Measure is understood to be broadly comparable across the U.S., although this has not been examined sufficiently. This comparability will likely hold in many other countries as well, but may not in some.

An important aspect of developing a new measure is ensuring that it is valid. This requires the availability of criterion measures for comparison. Most attempts to evaluate the validity of food security measures have used determinants or consequences, such as economic resources, dietary intake, or nutritional status, as criterion measures (Figure 1). These measures, however, are usually not more definitive or accurate than the measures of food security being tested. Associations between these criterion measures and measures of food security are often found to be weak; these associations are then inconclusive as to whether it is the developed measure or the criterion or both that inaccurately reflect food insecurity.

Accuracy (i.e., lack of bias) is best assessed by comparison to a definitive criterion, one that achieves high accuracy by relying on first principles, i.e., by reflecting in a fundamental way the theoretical structure of the phenomena it purports to represent [8]. An important challenge is obtaining definitive

criterion measures so that validation efforts will be conclusive. One way to develop a definitive measure is to base it on information gained from an in-depth understanding of the experience itself through a personal interview with the respondent, and to use expert

judgement to integrate this information to classify households as to food security status. This method was used in assessing the validity of food security measures in the U.S. and Canada [9,12,24]

Form of Measures

Another important issue is what form a measure should take. This depends on the information needed and the purposes and decisions for which it will be used. For example, for planning and designing interventions, a qualitative assessment of food security may be adequate, while for monitoring and assessing food aid needs, a quantitative measure is probably needed. The U.S. measure and quantitative scale indicating levels of severity was appropriate to the information needs there, but might not be appropriate elsewhere. In some cases, multiple measures might be needed to effectively capture the multiple dimensions to the problem of food security, or to support the information needs of different program approaches [23]. It may also be important that the form of the measure allow assessments to be timed according to the volatility of the food situation and the appropriate seasons.

Application Issues

In developing countries, the food situation is often volatile. It is important to measure not only the current situation, but also uncertainty of the future situation (i.e., vulnerability) and to assess changes in risk status over time, taking account of the choices households make to allocate their resources over time in ways that try to balance ensuring current access without jeopardizing future food consumption.

An important challenge to directly assessing household food security by asking people about their experience is possible intentional bias in reporting due to self-interest. That is, respondents may answer untruthfully to gain food or other assistance. This is a problem in some developing countries such as Mozambique (D. Rose, personal communication). The opposite challenge may also occur if people are reluctant to express the deprivation that they experience because of embarrassment. The research underlying the development of the U.S. Food Security Measure found that it was possible to largely avoid such reporting bias through careful construction of questionnaire items.

There are a number of other issues regarding the potential portability of the U.S. approach to measuring household food security in developing countries [25]. One is that food insecurity may be defined differently in developing countries than in the U.S. where it is typically much less severe and is a social as well as biological matter. Another is that experiential-based measures should be used to complement rather than replace indirect measures, since these often describe reasons for food insecurity and increase use and value of regularly-collected statistics. Finally, research is needed to determine whether there are fundamental constraints to applying the U.S. approach where immediacy, prevalence, and severity of prolonged food deprivation is high.

SUMMARY AND RECOMMENDATIONS

There is no simple formula for constructing valid measures of food security. From research to date, however, the approach of developing measures based on an in-depth understanding of the experience of food insecurity has great potential. This approach involves obtaining an in-depth understanding and turning this understanding into a measure from which an indicator can be chosen. The measure and indicators need to be validated, ideally against definitive measures.

To evaluate the potential for this approach, operations research should be conducted to:

1. Construct and validate measures of food insecurity based on people's experience using both qualitative and quantitative methods in a variety of locations,
2. Based on this research, develop a practical protocol that can be feasibly applied in a wide variety of locations to facilitate construction of appropriate experiential-based measures of food insecurity, and
3. Disseminate the results and the protocol, and promote their appropriate use.

Additional objectives include understanding:

- What methods are most useful and feasible for obtaining in-depth understanding of food insecurity
- Which aspects of food security are universal and which are specific across locations and cultures
- How to develop definitive measures for assessing validity
- How to construct measures that minimize self-interest bias
- In what circumstances a quantitative scale can be constructed indicating levels of severity
- Rules for classifying households to create indicators from the measures
- How to construct measures to monitor changes in individual households over time
- In what circumstances multiple measures are needed to capture the multiple dimensions of food security.

REFERENCES

1. Maxwell, S. and Frankenberger T. Household food security: concepts, indicators, measurements. A technical review. New York, NY: UNICEF and Rome: IFAD, 1992.
2. Bickel, G.; Nord, M.; Price, C.; Hamilton, W.; and Cook, J. Measuring Food Security in the United States: Guide to Measuring Household Food Security (Revised Edition of Guide to Implementing the Core Food Security Module, 1997). Washington, DC: U.S. Dept. of Agriculture (in press).
3. Radimer, K. L. Understanding hunger and developing indicators to assess it. Ph.D. Thesis. Ithaca, NY: Cornell University Press, 1990.
4. Radimer, K.L.; Olson, C.M.; Greene, J.C.; Campbell, C.C.; and Habicht, J.P. Understanding hunger and developing indicators to assess it in women and children. *J Nutr Educ* 1992;24:36S-45S.
5. Haddad, L.; Kennedy, E.; and Sullivan, J. Choice of indicators for food security and nutrition monitoring. *Food Policy* 1994;19(3):329-343.
6. Maxwell, D. Measuring food insecurity: the frequency and severity of "coping strategies." *Food Policy* 1996;21(3):291-303.
7. Maxwell, D.; Ahiadeke, C.; Levin, C.; Armar-Klemesu, M.; Zakariah, S.; and Lamptey, G.M. Alternative food-security indicators: revisiting the frequency and severity of 'coping strategies.' *Food Policy* 1999;24:411-429.
8. Frongillo, E.A. Jr. Validation of measures of food insecurity and hunger. *J Nutr* 1999;129:506-9.
9. Hamelin, A-M.; Habicht, J.P.; and Beaudry, M. Food insecurity: consequences for the household and broader social implications. *J Nutr* 1999;129:525S-528S.
10. Kendall, A.; Olson, C.M.; Frongillo, E.A. Jr.; and Kepple, A. Validation of the Radimer/Cornell hunger and food insecurity measures: final project report. Division of Nutritional Sciences, Cornell University, 1994 (mimeograph).
11. Kendall, A.; Olson, C.M.; and Frongillo, E.A. Jr. Validation of the Radimer/Cornell measures of hunger and food insecurity. *J Nutr* 1995;125:2793-2801.
12. Frongillo, E.A. Jr.; Rauschenbach, B.S.; Olson, C.M.; Kendall, A.; and Colmenares, A.G. Questionnaire-based measures are valid for the identification of households with hunger and food insecurity. *J Nutr* 1997;127:699-705.
13. Hamilton, W.L.; Cook, J.T.; Thompson, W.W.; Buron, L.F.; Frongillo, E.A. Jr.; Olson, C.M.; and Wehler, C.A. Household food security in the United States in 1995: technical report of the food security

measurement project. Washington, DC: U.S. Dept. of Agriculture Food and Consumer Service, Office of Analysis and Evaluation and Abt Associates, Inc., 1997.

14. Gittelsohn, J.; Mookherji, and S.; Pelto, G. Operationalizing household food security in rural Nepal. *Food Nutr Bull* 1998;19(3):210-222.

15. Chung, K.; Haddad, L.; Ramakrishna, J.; and Riely, F. Identifying the food insecure: the application of mixed-method approaches in India. Washington, DC: International Food Policy Research Institute, 1997.

16. Schoonmaker Freudenberger, K. Rapid Rural Appraisal (RRA) and Participatory Rural Appraisal (PRA): a manual for CRS field workers and partners. Washington, DC: Catholic Relief Services, 1999.

17. Nyborg, I. and Haug, R. Food security indicators for development activities by Norwegian NGOs in Mali, Ethiopia and Eritrea. Aas, Norway: Centre for International Environment and Development Studies (NORAGRIC), Agricultural University of Norway, 1994.

18. Nyborg, I. and Haug R. Measuring household food security: a participatory process approach. *Forum for Development Studies* 1995;1:29-59.

19. Gervais, S. and Schoonmaker Freudenberger, K. Africare field manual on the design, implementation, monitoring and evaluation of food security activities. Final Draft, Jan. 1999. Washington, DC: Africare.

20. Boudreau, T. The Food Economy Approach: a framework for understanding rural livelihoods. Relief and Rehabilitation Network Paper #26. London: Overseas Development Institute, 1998.

21. Phillips, T. and Taylor, D. Household food security: an assessment method. *Canadian Journal of Development Studies* 1998;19(Special Issue):257-275.

22. Davies, S. Adaptable livelihoods: coping with food insecurity in the Malian Sahel. London: MacMillan Press, 1996.

23. Riely, F.; Mock, N.; Cogill, B.; Bailey, L.; and Kenefick, E. Food security indicators and framework for use in the monitoring and evaluation of food aid programs. Arlington VA: Food Security and Nutrition Monitoring (IMPACT) Project, for the U.S. Agency for International Development, 1997.

24. Wolfe, W.S.; Olson, C.M.; Kendall, A.; and Frongillo, E.A. Jr. Hunger and food insecurity in the elderly: its nature and measurement. *J Aging and Health* 1998;10(3):327-350.

25. Eilerts, G.S. Food security measurement in the United States: new ideas for third-world assessments? Rome: Food Insecurity and Vulnerability Information and Mapping Systems, Food and Agriculture Organization, United Nations, 1999.

FIGURE 1. A conceptual framework based on understanding of food security in the U.S.

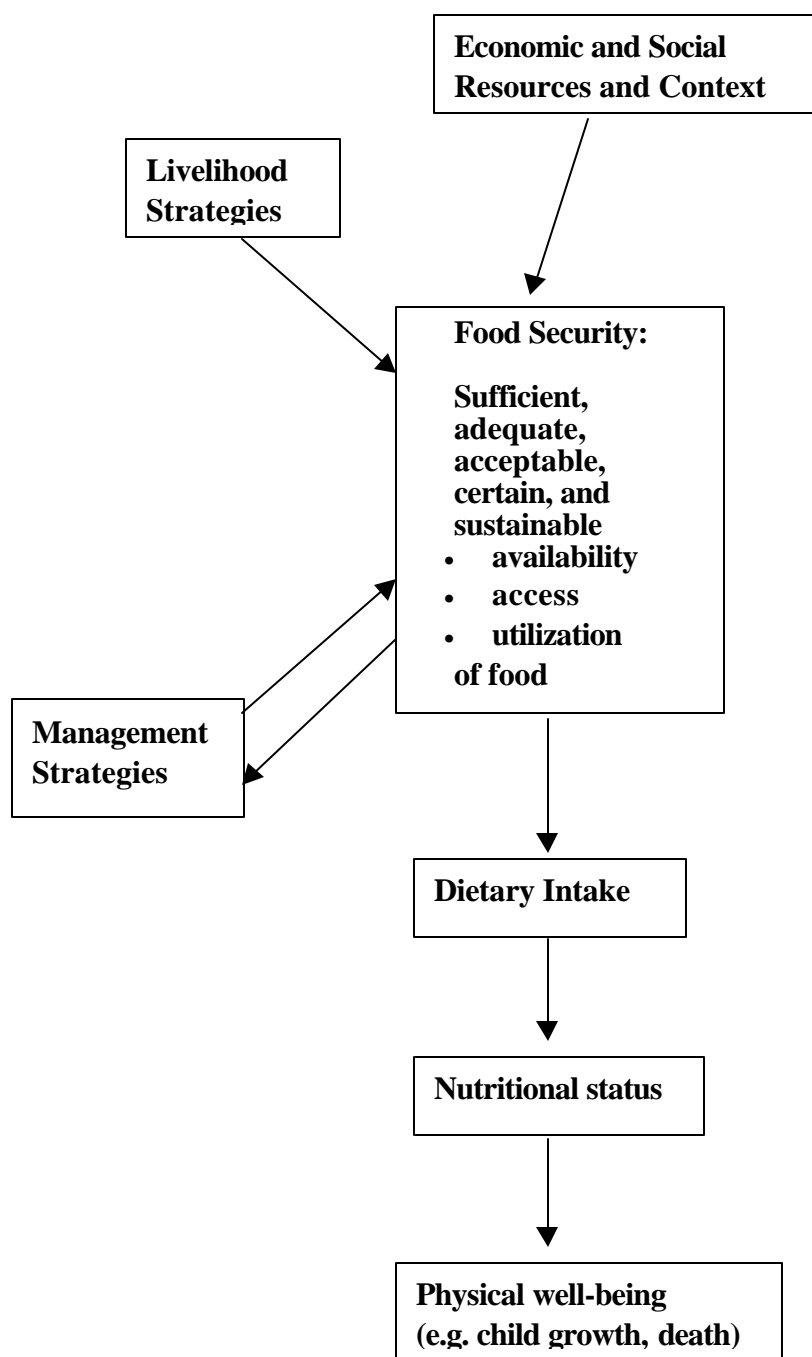


TABLE 1. Questions included in the U.S. national food security measurement tool

- In the last 12 months, did you or other adults in your household ever ***cut the size of your meals or skip meals*** because there wasn't enough money for food? How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
- In the last 12 months, did you or other adults in your household ever ***not eat for a whole day*** because there wasn't enough money for food? How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?
- In the last 12 months, did you ever ***eat less than you felt you should*** because there wasn't enough money to buy food?
- In the last 12 months, were you ever ***hungry but didn't eat*** because you couldn't afford enough food?
- Sometimes people lose weight because they don't have enough to eat. In the last 12 months, did you ***lose weight*** because there wasn't enough food?
- In the last 12 months, did you ever ***cut the size of any of the children's meals*** because there wasn't enough money for food?^a
- In the last 12 months, did any of the ***children ever skip a meal*** because there wasn't enough money for food? How often did this happen—almost every month, some months but not every month, or in only 1 or 2 months?^a
- In the last 12 months, were the ***children ever hungry*** but you just couldn't afford more food?^a
- In the last 12 months, did any of the ***children ever not eat for a whole day*** because there wasn't enough money for food?^a
- “I ***worried whether our food would run out*** before we got money to buy more.” Was that often, sometimes, or never true for you in the last 12 months?
- “The ***food that we bought just didn't last***, and we didn't have money to get more.” Was that often, sometimes, or never true for you in the last 12 months?
- “We ***couldn't afford to eat balanced meals***.” Was that often, sometimes, or never true for you in the last 12 months?
- “We ***couldn't feed the children a balanced meal*** because we couldn't afford that.” Was that often, sometimes, or never true for you in the last 12 months?^a
- “The ***children were not eating enough*** because we just couldn't afford enough food.” Was that often, sometimes, or never true for you in the last 12 months?^a
- “We ***relied on only a few kinds of low-cost food to feed the children*** because we were running out of money to buy food.” Was that often, sometimes, or never true for you in the last 12 months?^a

^aQuestion asked only of households with children.